— Slope Soaring Rules —

Slope Aerobatics

Definition

1 Slope Soaring Aerobatics consists of individual flights in which each competitor attempts to carry out a pre-selected schedule of aerobatic manoeuvres in front of a panel of judges who award points for the accuracy of the manoeuvres.

The Competition

2 A competition consists of three rounds, in each of which each competitor is allowed one attempt to complete a flight, but if adverse weather conditions prevent the completion of three rounds in the available time, the rounds completed form the competition.

3 Each flight shall be judged by a panel of at least three judges, and each judge shall award each manoeuvre a score in whole numbers from 0 to 10.

4 Each score shall be multiplied by the appropriate K-factor and the total of each judges scores for the flight shall be calculated. The average of the scores of the three judges is taken as the competitor's score for that flight.

5 The total of each competitor's better two scores is taken as his final score. If fewer than three rounds are completed, the total score is taken as the final score.

Classes

6 Two classes of competition are recognized, and a competitor may enter one class only. The classes are as follows —

a **Intermediate.** A competitor may enter the Intermediate Class if he has never previously placed in the first three in the Intermediate Class at a national competition, and has never won the Intermediate Class at a provincial competition, and has never entered the Expert Class in a national or provincial competition.

Note: The winner of the Intermediate Class in a National Event must upgrade to Expert, while the second and third placed competitors have the choice of upgrading or remaining in Intermediate.

b **Expert.** A competitor may enter the Expert Class if he wishes to do so, or if he is not eligible to enter the Intermediate Class.

Note: Those competitors placed in the lower 25% of the expert competition in a National Event may choose to downgrade to Intermediate.

7 In addition, a Novice award shall be made to the highest placed entrant who has been flying R/C aircraft (of any sort) for less than one year. It is intended that this

award should not be won by the winner of one of the other classes, whatever the circumstances.

Commentary: The intent of this section is to separate the experts from the less experienced competitors such as is done in power aerobatics, as it is disheartening for a not-so-expert flyer to have no chance to win anything at all. The Novice award is intended to encourage newcomers without reducing the National Championships to a beginners competition.

Use Of Different Models

8 A competitor may use any number of models (but not more than one in any one round), and more than one competitor may use the same model, but in this case each competitor using the same model must accept the consequences if, for example, the model is damaged on landing or crashes.

Schedule of Manoeuvres

9 **Expert Class.**
The schedule of manoeuvres, and the applicable K-factor (K), is as follows —

a	Double Immelman	K = 9	f	Figure M	K = 12
b	Vertical eight	K = 10	g	Three rolls	K = 13
c	Cuban eight	K = 10	h	Four point roll	K = 14
d	Slow roll	K = 11	i	Rolling eight	K = 15
e	Three inside loops	K = 12			

Commentary: In practice, every serious competitor in this class will always choose the maximum K-factor manoeuvres. It is therefore deemed unnecessary to allow options for the Expert Class.

10 **Intermediate Class.**
The schedule of manoeuvres, and the applicable K-factor (K), is as follows —

a	One inside loop	K = 5
b	One roll	K = 5
c	Split S	K = 5
d	Immelman turn	K = 6
e	Four optional manoeuvres, selected from the following list —	

11 **Optional manoeuvres.**

a	Stall turn	K = 6	j	Vertical eight	K = 10
b	Rectangular approach	K = 6	k	Slow roll	K = 11
c	Straight inverted	K = 7	l	Horizontal eight	K = 12
d	Two inside loops	K = 8	m	Three outside loops	K = 12
e	Two rolls	K = 8	n	Inverted eight	K = 12
f	Three turn spin	K = 8	o	Figure-M	K = 12
g	Double Immelman	K = 9	p	Three rolls	K = 13
h	Three inside loops	K = 10	q	Four-point roll	K = 14
i	Cuban eight	K = 10	r	Rolling eight	K = 15

Commentary: The Optional manoeuvres have been chosen to allow a novice to choose options to match his ability but also to allow any pilot to show his full capability and to maximize his score.

The Flight

12 Each competitor is entitled to one attempt to complete an official flight during each round of the competition.

Note: If a competitor is unable to complete his flight, or his flight is adversely affected, for reasons beyond his control, the CD may, at his sole discretion, award a reflight.

13 When called to do so by the CD a competitor must commence his flight within one minute, by launching by hand from the area designated by the CD. The competitor then has a period of twelve minutes to complete his schedule.

14 If a competitor appeals for extra time, and, in the opinion of the CD, the conditions are such that a normal model is able to gain height only slowly, the CD may allow the competitor an additional period of three minutes.

15 If, in the opinion of the CD, a normal model is unable to gain sufficient height to perform aerobatic manoeuvres, he may stop the competition until conditions improve. On resumption of flying, a competitor whose flight was interrupted may, at his own option, either —

a start his flight again from the beginning; or

b continue by repeating the last manoeuvre that he completed.

16 In choosing between (a) and (b) above, the competitor shall have no access to the scores already awarded for his completed manoeuvres. Any number of reflights may be awarded under this rule.

Note: In order to apply the previous two rules (above) fairly, it is essential that, whenever the conditions are such that poor lift is likely to be encountered, the CD watches the flying continuously — therefore it is recommended that the CD delegate this task to a competent official.

17 In applying these rules the CD must consider whether a competitor is taking unnecessarily long to gain height, or is climbing to excessive height before each manoeuvre. It is not sufficient simply to note that a competitor is taking a long time to complete each manoeuvre.

Commentary: The object of aerobatics competition is to test the pilot's ability to perform accurate aerobatic manoeuvres, and not his skill in utilizing poor lift conditions. The usual strict time limits are intended to assist in the rapid completion of the competition. The relaxation of time limits proposed in the above sections is intended to give the competitors a reasonable chance to complete their flights successfully while still giving the organizers some control over the rate of progress. It will be essential for the official making these decisions to be familiar with slope flying, and to closely observe all flying.

18 During the flight the competitor or his helper must announce the name of each manoeuvre just before he intends to execute it, and then he or his helper must call NOW to mark the commencement of the manoeuvre, and COMPLETE to mark the end of the manoeuvre.

19 In order to assist the rapid completion of flights, the CD may instruct the next competitor to launch his model while the previous competitor is still flying. In this case the second competitor should be instructed to launch his model when the previous competitor has two manoeuvres left to complete, and he must then keep his model well clear of the area in front of the Judges. The first competitor must land his model immediately on completion of his flight, and timing of the second competitor's flight begins immediately the CD instructs him to commence his flight. If, in the opinion of the CD, the second competitor interferes in any way with the competition flight in progress, and if so desired by the competitor, the CD may allow the affected manoeuvre(s) to be repeated.

20 The order of flight for the first round shall be decided by a draw but, in the event that two competitors who are using the same radio frequency are drawn to fly consecutively, the CD may, before flying commences, change the flight order and move one of the competitors up or down the order far enough to avoid the frequency clash.

21 The order of flying for the second and third rounds shall be as for the first except that the starting point shall be moved down the list one-third of the number of competitors for each round.

Manoeuvres

22 With the exception of the next paragraph (below), all manoeuvres commence and end with a short portion of straight and level flight, and the competitor or his helper must call NOW and COMPLETE at the beginning and end of this straight flight.

23 Manoeuvres which commence with straight and level flight followed by pulling up into a loop, may be commenced with a straight dive, followed by pulling up directly into the loop. In this case the competitor or his helper must call NOW when the model is diving in a straight line, and a portion of the dive and the portion of the loop to reach the level position are considered to be (and are judged as) part of the manoeuvre.

24 All loops and part loops are to be circular, and all rolls and part rolls are to be axial and (unless otherwise described) at a constant rate of roll.

25 In every case where more than one loop occurs in a manoeuvre, each loop shall be of the same apparent size. When more than one roll occurs, each roll shall be at the same rate.

26 Unless otherwise described, all manoeuvres must be positioned symmetrically about a vertical plane (called the center line), that must be pre-determined by the CD and on request, pointed out to the competitor, and that is at approximately 90 degrees to the slope (i.e. into wind).

27 Unless otherwise described, all manoeuvres commence flying cross-wind in a direction at 90 degrees to the center line.

28 A score of zero should be given if any part of a manoeuvre occurs behind the line of the judges — a clever call of "complete" just before going behind will not fool the judges!

Description of Manoeuvres

29 **One Inside Loop.** The model flies straight and level (s & l), performs one inside loop and then flies s & l.

30 **One Roll.** The model flies s & l, rotates smoothly around its londitudinal axis and then flies s & l.

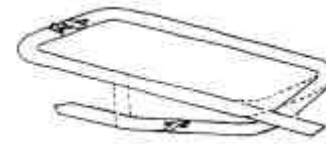
31 **Split S.** The modelflies s & l, performs one half roll, immediately followed by one half loop, and then flies s & l.

32 **Immelman Turn**. The model flies s & l, performs one half loop, immediately followed by one half roll, and then flies s & l.

33 **Stall Turn.** The model flies s & l at 90 degrees to the center line and just past the centre line, performs one-quarter of an inside loop (to a vertical attitude, and at a position about 45 degrees from the centre line from the viewpoint of the judges), continues to fly vertically upwards for a short distance, yaws (into wind) through 180 degrees, flies vertically downwards for a short distance, performs one-quarter of an inside loop, then flies s & l at the same altitude but on the opposite heading to the start of the manoeuvre.

Note: A score of zero should be given if the model falls more forward or backward than sideways.

34 **Rectangular Landing Pattern**.



The model flies s & l along the centre line, into the wind, turns through 90 degrees, flies s & l (for about half the length of the first leg), turns through 90 degrees in the same direction as the first turn, flies s & l (for about the same distance as the first leg), turns through 90 degrees in the same direction as the first turn, (without losing height to this point) flies straight, commencing a slow descent, along a line approximately parallel to the slope and in front of the judges, turns through 90 degrees in the same direction as the first turn, flies straight along the centre line (for approximately half the length of the first leg), while continuing to descend.

35 **Straight Inverted Flight**.

The model flies s & l, performs one half roll, flies s & l inverted for about five seconds, performs a second half roll, and then flies s & l.

36 **Two Inside Loops.**

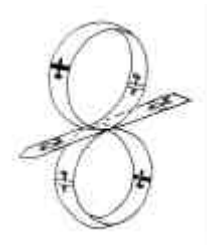
The model flies s & l, performs two consecutive inside loops and then flies s & l.

37 **Two Rolls.** The model flies s & l, rotates 720^{O} around its longitudinal axis and then flies s & l.

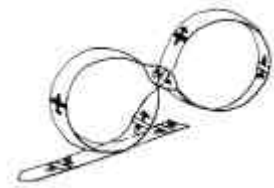
38 **Three Turn Spin**. The model flies s & l into wind, slows down until it stalls and, in a fully stalled condition, falls into a spin. At the end of three revolutions the model recovers from the spin, flies vertically downwards to regain flying speed, performs one-quarter of a loop, and then flies s & l in the same direction as the start of the manoeuvre.

39 **Double Immelman.** The model flies s & l and performs one half loop, immediately performs one half roll, flies s & l for about one second, performs one half outside loop, immediately performs one half roll then flies s & l at the same altitude and heading as the start of the manoeuvre.

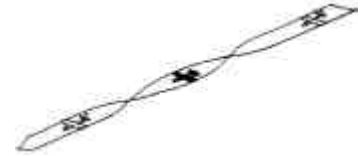
40 **Vertical Eight.** The model flies s & l, performs one inside loop, immediately performs one outside loop, then flies s & l at the same altitude and heading as the start of the manoeuvre.



41 **Cuban Eight.** The model flies s & l, performs five-eighths of a loop (to an inverted 45° diving attitude), performs one half roll (the centre of the half roll being at the height of the centre of the loop), performs three quarters of a loop (to an inverted 45° diving attitude, with the centre of the loop at the same altitude as the first loop), performs one half roll (the centre of the half roll being at the height of the centre of the loop), performs one eighth of a loop then flies s & l at the same altitude and heading as the start.

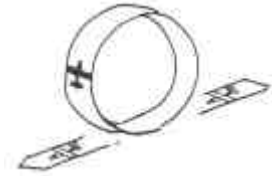


42 **Slow Roll.** The model flies s & l, performs one roll then flies s & l. The roll shall be at a uniform rate and shall take approximately five seconds.

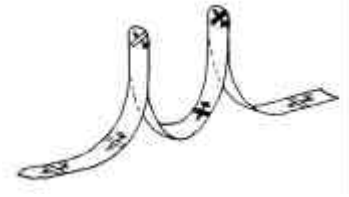


Note: A significantly faster roll should be downgraded proportionately, e.g. a roll executed in approximately 3 seconds should be downgraded 50%, and a roll executed in 1 second scored zero.

43 **Three Inside Loops.** The model flies s & l, performs three consecutive inside loops and then flies s & l.

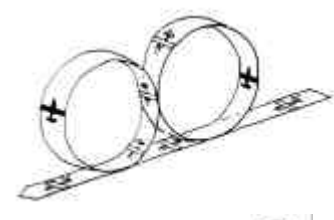


44 **Figure M** . The model flies s & l, performs one quarter of an inside loop, continues to fly vertically upwards for a short distance, yaws (into wind) through 180°, flies vertically downwards for a short distance, performs one half of an outside loop, continues to fly vertically upward for a short time, yaws (into wind) through 180°, flies vertically downward for a short distance, performs one quarter of an inside loop, then flies s & l at the same altitude and heading as the start of the manoeuvre.



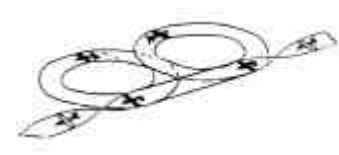
Note: A score of zero should be awarded if, in either stall turn, the model falls more forward or backward than sideways.

45 **Horizontal Eight.** The model flies s & l, performs three-quarters of an inside loop (to a vertically downward attitude), performs one inside loop (to a vertically downward attitude), performs one quarter of an inside loop then flies s & l at the same altitude and heading as the start of the manoeuvre.



46 **Three Outside Loops.** The model flies s & l, performs three consecutive outside loops (downward) and then flies s & l.

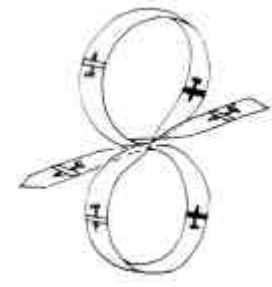
47 **Inverted Eight.** The model flies s & l across wind, performs one half roll to an inverted attitude, turns (into wind) through 90°, immediately turns in the opposite direction through 360°, immediately turns in the first direction through 270°, performs one half roll, then flies s & l at the same altitude and heading as the start of the manoeuvre.



48 **Three Rolls.** The model flies s & l, performs three consecutive rolls, and then flies s & l.

49 **Four Point Roll.** The model flies s & l, rolls through 90° to a knife-edge attitude, hesitates briefly before repeating the quarter-rolls and hesitations back to a wings-level attitude, then flies s & l.

50 **Rolling Eight.** The model flies s & l, performs one half roll, performs one outside loop (upward), performs one half roll, performs one outside loop (down- ward), then flies s & l. The half roll is performed simultaneously with the last portion of the first loop and the first portion of the second loop.



Judge's Guide

51 In awarding scores judges should bear the following in mind —

a A perfectly performed manoeuvre deserves 10 points.

b An unrecognizable manoeuvre, or one that is missing and essential part (e.g. only one loop performed for two loops), deserves zero. A manoeuvre that is recognizable as the manoeuvre being attempted deserves a score.

52 The qualities to look for in assessing a manoeuvre can be summarized as —

a shape of manoeuvre (eg. roundness of loops)
b superimposition (eg. second loop superimposed on first — not necessarily
c same size — see 58 below)
symmetry (eg. two (side-by-side) loops (in cuban-8 or horizontal-8) or one
d loop above another (vertical-8) of equal size)
e positioning (eg. center of manoeuvre on judges center line)
f smoothness
heading (eg. manoeuvre performed perpendicular to center line)

56 Scores should not be assessed by simply counting defects and subtracting the number from 10, as this will frequently end up as a negative number, especially for complex manoeuvres, and this is not the intention.

57 In general, it is up to the competitor to compensate for the conditions, and judges must not take the conditions into account, but certain specific cases should be considered. For example, it is only partially possible to compensate for drift downwind during the approach to the Three Turn Spin, and it is totally impossible to compensate during the actual spins (if they are true spins!), therefore these defects should not be the cause of subtracting points.

58 In the case of consecutive loops, it is possible to partially compensate for drift by continuously banking the model into wind, but when the wind speed increases this becomes less and less effective, so that it has become an acceptable common practice to make the loops smaller as the model comes closer to the judges, so that if they are correctly positioned, they will appear to be the same size and superimposed.